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Agricultural Liming Materials

Lime purchasers should always remember that in order for a particle of soil-liming material to work on a particle of soil, there must be direct contact between the two. Therefore, the finer the liming material applied, the greater the number of particles there will be to come into contact with particles of the soil; and the more efficient the application.

STATE LIME DEPARTMENT
Controlled by
UNIVERSITY OF MARYLAND
COLLEGE PARK, MD.

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AGRICULTURAL LIMING MATERIALS

November 1, 1924—November 1, 1925.

Compiled and edited under the supervision and direction of N. E. Gordon, State Chemist, and L. E. Bopst, in charge of Lime, Feed and Fertilizer Departments.

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The inspection, analysis and control work of the lime, feed and fertlizer trade is carried on by the State Department, but the State Department is so related to the chemical work of the University that the other men of the Chemical Staff who are mentioned below may be called on for help in time of need; and, furthermore, it is the purpose of the majority of this Chemical Staff to be carrying on some investigations which bear directly or indirectly on the properties of lime, feed and fertilizer.

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INTRODUCTION

The duties of the Lime Inspection Service, as set forth in the State Lime Law, consist in the registration of brands to be offered for sale; the inspection of methods of labeling and selling; the collection and analysis of official samples, and the publication of the results obtained. This bulletin constitutes a report of the work performed from November 1, 1924, to November 1, 1925, and contains a record of the analyses of official samples obtained during that period.

In the interval of time outlined above, State Lime Inspectors collected from dealers and manufacturers' stocks and from shipments in transit eighty-five samples of agricultural liming materials. All of these samples were analyzed and the results reported to the respective manufacturers, dealers, and whenever possible, to the consumers.

The Lime Inspection Service wishes to emphasize the fact that all samples covered by analyses in this publication were taken by official Inspectors in the regular course of their duties and do not represent samples forwarded by interested parties.

It is with a great deal of pleasure that we announce very few deficiencies for the past year. Where shortages have been found existing manufacturers have made every possible effort to discover and eliminate the causes of such deficiencies. This Department wishes to publicly and appreciatively acknowledge the commendable spirit in which most manufacturers have co-operated in the effort to keep the market free of deficient goods.

Sum of the Oxides

Our attention has been called to the fact that certain lime purchasers during the past year bought lime solely on a calcium guarantee. Their attention is hereby called to the fact that oxide of magnesia is also found to a certain extent in limestone, and for the purposes of this bulletin the sum of the calcium oxide and the magnesium oxide as shown in the last column of the chemical analyses is taken as the relative value of the liming material for correcting soil acidity.

High-Calcium and High-Magnesium Liming Materials

Because of the numerous requests which come to us from farmers and others over the State desiring information on the relative values of high-calcium and high-magnesium limes for soil liming, it is thought appropriate at this time to discuss the respective merits of the two materials insofar as the results of tests and experiments have demonstrated their adaptability to the various purposes for which they are used.

In order to determine whether a liming material derived from a dolomitic (high-magnesium) limestone is as suitable for soil liming as is a liming material derived from a high-calcium source, it is first advisable to consider the specific object for which the material is to be applied.

As a Plant Food

Chemical analyses of the plants which are ordinarily used as farm crops have disclosed the fact that both magnesia and calcium are included among those elements of which the plants are composed.

Plainly then it is necesary that both calcium and magnesia be present in the soils on which ordinary farm crops are to be grown.

In the case of the calcium this fact has been demonstrated at the Tennessee Experiment Station in a test where certain soils have been naturally depleted of their original calcium supply until they are now so sterile that practically no plant growth may be obtained upon them. Calcium added to these soils has resulted in their again producing crops. In the case of magnesia starvation there are soils under experiment by the United States Department of Agriculture at Upper Marlboro, Md., which have been continuously cropped until the original suply of magnesia has become so exhausted that certain crop growth is practically prohibited. The addition of magnesium limes to these soils has resulted in again establishing satisfactory plant growth.

Just how much magnesia and how much calcium farm crops take in through their root systems, which is their only means of securing these elements, varies considerably with the crop —tobacco has a high-magnesium requirement; clover has a high-calcium requirement. But in general, the actual amounts of these elements taken by the plants are relatively small, as

compared with the total lime requirement of a soil when determined by the customary methods, and it is reasonably safe to say that, leaving out tobacco on certain soils, there is enough magnesia for the usual crops in practically all of the liming materials reported on in the tabulated analyses in this bulletin, except the oyster shell and marl materials, which contain negligible quantities of magnesia. On the other hand, it will also be seen from these analyses that all of the high-magnesium limes contain sufficient calcium to protect plant growth against calcium starvation.

So far as lime for plant growth is concerned, then, there is little to choose between such liming materials as we have sampled that were derived from high-calcium limestone and those that were derived from high-magnesium limestone, except of course in the case of tobacco crops. Marls and oyster shells, as plant food carriers, are highly satisfactory in the role of calcium suppliers, but the magnesia they contain is not in any appreciable amount.

As a Physical Agent

It has long been known that lime sometimes exerts a certain physical effect on heavy soils which tends to granulate the entire soil structure, causing a general improvement in its work-ability.

At the Cornell University Experiment Station the "friability" of a particular soil was improved fully one-half by the use of a burned form of lime. The Oklahoma Experiment Station determined that an ordinary application of finely ground limestone made a hard clay soil so permeable that alfalfa roots penetrated it to a depth 13 inches greater than the roots of alfalfa on the same type of soil that had not been limed.

However, while certain other experiments have shown definite results on this physical effects of liming, yet at the same time many carefully conducted tests over the entire lime using section of this country have failed to corroborate such findings to any marked degree, and the general tendency in educational work has been to more or less ignore the physical benefits that may come to a soil from an application of lime.

But regardless of whether or not lime can appreciably change the physical condition of any large group of soils other

than the heavy clays, there is certainly nothing in any experimental work thus far published to indicate that preference should be given a high-calcium material over a high-magnesium material, or vice versa, when the materials are to be applied for this purpose.

As a Soil "Acidity" Corrector

To correct what is commonly known as soil "acidity" is the purpose for which liming materials are usually put on the soil, and many of the State Agricultural Experiment Stations in this country have conducted tests to determine if there is a difference in the power of high-magnesium and high-calcium limes to neutralize the so-called "acidity".

In some instances results have been obtained in such experiments which would seem to indicate that the high-calcium lime is the more efficient, and in other instances there have been indications that high-magnesium material has been the best worker. For example, a published work from the Wisconsin Experiment Station is quite favorable to dolomitic limes because of an action the magnesia seems to have had upon certain beneficial soil organisms. On the other hand, there are plots under test at the New Jersey Experiment Station where high-calcium material has caused a greater growth of the crop than that produced by the high-magnesium material.

In the tests of both of these stations just mentioned, the differences in yields between the plots receiving high-calcium lime and those receiving high-magnesium lime were as nothing when compared to the differences in yields between the unlimed plots and the limed plots. The latter produces materially heavier yields in all instances, regardless of which kind of lime they had received.

Probably as complete a work of this kind as any, is that which has been done at the Ohio Agricultural Experiment Station, where, in a four-year rotation, hydrated limes of a high-magnesium content and of a high-calcium content, and ground limestones of similar compositions were all compared to one another, the applications being made to the soil once in each four-year period. From the published results of these tests the following table is constructed:

CROP YIELDS FROM HIGH-MAGNESIUM AND HIGH-CALCIUM LIMES

Kind of Lime Used	Average Yield Per Acre 1915-1923			
	Corn	Oats	Wheat	Clover
	Bus.	*Bus.*	*Bus.*	*Lbs.*
High-Magnesium	61.94	52.92	29.32	3,874
High-Calcium	62.16	54.40	30.63	3,810

From this table it is seen that there was a slightly larger yield of the grain crops grown on the plots that had received the high-calcium limes, but a slightly higher yield of clover hay from the plots that had been limed with the high-magnesium materials.

These differences in yields are so slight, however, as to be well within the limit of experimental error, and the only conclusions that can be drawn from the tests are that there is nothing to choose between the relative effects on soil of the high-magnesium and high-calcium materials, at least so far as the crop yields of a standard grain-and-grass rotation are concerned.

Exceptions

In saying, however, that high-calcium and high-magnesium limes are approximately equally effective for ordinary soil liming purposes, some special conditions must be borne in mind.

First, tobacco soils that have been continuously cropped over a long period of years, particularly light textured soils, are now known to very often be suffering from acute magnesia starvation. This magnesia starvation is evidenced on such soils by the prevalence of a disease known as "sand drown", which will sometimes completely check the growth of a tobacco crop, and which has been known to attack corn. This "sand drown" may be entirely corrected by the use of very small amounts of magnesia. As previously pointed out, most of the liming materials sold in Maryland, excepting oyster shells and marl, contain enough magnesia for this purpose, but the magnesia content of limes to be used on tobacco soils in Maryland is a factor into which it will always pay to look.

Second, if a soil is already well supplied with calcium there can be but little benefit derived by it from receiving an application of high-calcium material, and, vice versa, if a soil is already high in magnesia there can be but little good done to it by the magnesia in a dolomitic liming material. But Maryland soils of either of these types are rare, except of course in the case of virgin forests being first cleared and broken. In this case there of course rests beneath those previously undisturbed leaves the accumulated fertility of the ages, and it is usually abundant in every way.

TABLES

The following pages contain a detailed report of the results obtained in the inspection of limes from November 1, 1924, to November 1, 1925. Limes are considered deficient as regards chemical analysis when they are either one per cent. or more deficient in total oxides.

Consumers and agents are advised to study carefully this table and purchase from and represent companies who maintain their guarantees in every respect.

ANALYSES OF AGRICULTURAL BURNT LIME (OXIDES)

No.	Name of Manufacturer or Agent	Name of Lime	Place of Sampling	Calcium Oxide CaO		Magnesium Oxide MgO		Sand & Insol. (no Val.)	Total Oxides Equivalent CaO+MgO
				Found	Guaranteed	Found	Guaranteed	Found	
1589	J. E. Baker Company, York, Pennsylvania	Lump Lime	Billmyer, Pa.	84.73	85.00	3.64	3.00	.84	88.37
1590	S. W. Barrick and Sons, Woodsboro, Maryland	Agricultural Ground Burnt Lime	Woodsboro	76.95	65.00	2.39	5.00	4.84	79.34
*1591	S. W. Barrick and Sons, Woodsboro, Maryland	Agricultural Lump Lime	Woodsboro	87.13	85.00	1.05	5.00	.90	88.18
1651	George Bushey and Sons, Cavetown, Maryland	Ground Burnt Lime	Cavetown	77.67	85.00	12.50	2.00	3.32	90.17
1593	George Bushey and Sons, Cavetown, Maryland	Lump Lime	Cavetown	80.92	85.00	14.59	2.00	.80	95.51
1630	George Bushey and Sons, Cavetown, Maryland	Lump Lime	Cavetown	78.73	85.00	20.13	2.00	.60	98.86
1546	George Bushey and Sons, Cavetown, Maryland	Lump Lime	Cavetown	83.66	85.00	3.04	2.00	3.10	86.70
*1594	Fountain Rock Lime Co., Inc., Woodsboro	Old Reliable Fountain Rock Ground Lime	Walkersville	71.46	85.00	4.09	2.00	6.64	75.55
*1644	Fountain Rock Lime Co., Inc., Woodsboro	Old Reliable Fountain Rock Gr. Brt. Lime	Woodsboro	64.76	85.00	2.10	2.00	18.05	66.86
1625	Fountain Rock Lime Co., Inc., Woodsboro	Old Reliable Fountain Rock Lump Lime	Woodsboro	90.60	85.00	2.28	2.00	.48	92.88
1595	Fountain Rock Lime Co., Inc., Woodsboro	Old Reliable Fountain Rock Lump Lime	Walkersville	87.58	85.00	3.56	2.00	.48	91.14
*1596	M. J. Grove Lime Co., Lime Kiln, Maryland	Famous Frederick Co. Ground Lime	Lime Kiln	57.30	65.00	8.47	5.00	13.00	65.77
1646	M. J. Grove Lime Co., Lime Kiln, Maryland	Famous Frederick Co. Ground Burnt Lime	Frederick	76.74	65.00	4.69	5.00	2.60	81.43

1597	M. J. Grove Lime Co., Lime Kiln, Maryland	Famous Frederick Co. Lump Lime	Lime Kiln	89.60	65.00	4.16	5.00	.80	93.76
1627	M. J. Grove Lime Co., Lime Kiln, Maryland	Famous Frederick Co. Lump Lime	Lime Kiln	91.16	65.00	5.76	5.00	.40	96.92
1571	M. J. Grove Lime Co., Lime Kiln, Maryland	Famous Frederick Co. Lump Lime	Baltimore	91.69	65.00	.72	5.00	.10	92.41
1626	LeGore Lime Company, LeGore, Maryland	Lump Lime	LeGore	74.31	80.00	12.03	3.00	3.20	86.34
1598	Palmer Lime and Cement Co., New York, N. Y.	Lump Lime	York, Pennsylvania	94.64	88.00	1.48	6.00	.12	96.12
1599	Roy C. Saylor, Union Bridge, Maryland	Lump Lime	Union Bridge	92.32	85.00	1.60	-----	1.48	93.92
1561	Roy C. Saylor, Union Bridge, Maryland	Lump Lime	Union Bridge	92.82	85.00	.29	-----	1.75	93.11
1600	Shank and Etzler, Frederick, Maryland	Burnt Lump Lime	Frederick	57.56	55.00	36.93	25.00	2.48	94.49
1642	Shank and Etzler, Frederick, Maryland	Ground Burnt Lime	Frederick	56.38	55.00	25.14	25.00	11.70	81.52
1563	H. M. Spahr Lime and Stone Company, Thurmont, Md.	Agricultural Lump Lime	Spahr	63.56	63.66	19.66	19.66	2.96	83.22
1601	H. M. Spahr Lime and Stone Company, Thurmont, Md.	Agricultural Lump Lime	Thurmont	60.66	63.66	30.05	19.66	1.54	90.71
1602	Steacy and Wilton Company, Wrightsville, Pa.	Run of Kiln Lump Agricultural Lime	Bittinger, Pa.	86.92	80.00	8.60	-----	.80	95.52
1620	Steacy and Wilton Company, Wrightsville, Pa.	Run of Kiln Lump Agricultural Lime	Parkton	93.45	80.00	5.44	-----	.50	98.89

*Indicates product deficient in total Oxides.

ANALYSES OF AGRICULTURAL HYDRATED LIME.

No.	Name of Manufacturer or Agent	Name of Lime	Place of Sampling	Calcium Oxide CaO		Magnesium Oxide MgO		Sand & Insol. (no Val.)	Total Oxides Equivalent CaO+MgO
				Found	Guaranteed	Found	Guaranteed	Found	
1576	American Lime and Stone Co., Bellefonte, Pennsylvania	Bald-Eagle Hydrated Lime	Elkton	**74.36**	69.00	**.77**	1.00	**.88**	**75.13**
1605	J. E. Baker Company, York, Pennsylvania	Susquehanna Hydrated Lime	Billmyer, Pa.	**66.59**	65.00	**4.15**	3.00	**2.04**	**70.74**
1617	J. E. Baker Company, York, Pennsylvania	Victor Hydrated Lime	White Hall	**55.78**	55.00	**18.10**	15.00	**2.00**	**73.88**
1603	J. E. Baker Company, York, Pennsylvania	Victor Hydrated Lime	Billmyer, Pa.	**60.76**	55.00	**13.31**	15.00	**1.24**	**74.07**
*1606	S. W. Barrick and Sons, Woodsboro, Maryland	Agricultural Hydrated Lime	Woodsboro	**65.08**	65.00	**2.53**	5.00	**2.60**	**67.61**
1578	Blair Limestone Company, Pittsburgh, Pennsylvania	Opequon Hydrated Lime	Bel Air	**67.64**	65.00	**1.42**	2.00	**4.40**	**69.06**
1568	Blair Limestone Company, Pittsburgh, Pennsylvania	Special Hydrated Lime	Hampstead	**66.59**	60.00	**.80**	1.50	**3.64**	**67.39**
1638	Blair Limestone Company, Pittsburgh, Pennsylvania	Special Hydrated Lime	Salisbury	**66.47**	60.00	**1.88**	1.50	**1.72**	**68.35**
1629	Fountain Rock Lime Co., Inc., Woodsboro, Maryland	Old Reliable Hydrated Ftn. Rock Lime	Woodsboro	**59.52**	60.00	**3.90**	2.00	**7.10**	**63.42**
1608	Fountain Rock Lime Co., Inc., Woodsboro, Maryland	Old Reliable Hydrated Ftn. Rock Lime	Walkersville	**59.20**	60.00	**6.30**	2.00	**4.32**	**65.50**
1607	M. J. Grove Lime Company, Lime Kiln, Maryland	Famous Frederick Co. Hydrated Lime	Lime Kiln	**67.20**	65.00	**4.78**	5.00	**1.92**	**71.98**
1560	M. J. Grove Lime Company, Lime Kiln, Maryland	Famous Frederick Co. Hydrated Lime	Upper Marlboro	**66.08**	65.00	**4.99**	5.00	**2.18**	**71.07**
1548	M. J. Grove Lime Company, Lime Kiln, Maryland	Famous Frederick Co. Hydrated Lime	Laurel	**66.75**	65.00	**3.40**	5.00	**3.50**	**70.15**

1612	O. J. Keller Lime Company, Frederick, Maryland	Hydrated Lime	Buckeystown	**68.49**	70.00	**5.00**	2.00	**2.46**	**73.49**
1643	O. J. Keller Lime Company, Frederick, Maryland	Hydrated Lime	Frederick	**68.10**	70.00	**3.55**	2.00	**4.52**	**71.65**
*1636	LeGore Lime Company, LeGore, Maryland	Hydrated Lime	Westminster	**63.95**	67.00	**3.33**	3.00	**11.42**	**67.28**
*1628	LeGore Lime Company, LeGore, Maryland	Hydrated Lime	Woodsboro	**59.69**	67.00	**3.62**	3.00	**7.00**	**63.31**
*1565	LeGore Lime Company, LeGore, Maryland	Hydrated Lime	Emmitsburg	**62.70**	67.00	**2.89**	3.00	**5.40**	**65.59**
*1580	LeGore Lime Company, LeGore, Maryland	Hydrated Lime	Salisbury	**60.41**	67.00	**3.95**	3.00	**7.10**	**64.36**
1611	LeGore Lime Company, LeGore, Maryland	Hydrated Lime	LeGore	**65.07**	67.00	**4.62**	3.00	**4.26**	**69.69**
*1640	LeGore Lime Company, LeGore, Maryland	Hydrated Lime	Salisbury	**59.36**	67.00	**4.34**	3.00	**14.40**	**63.70**
*1647	LeGore Lime Company, LeGore, Maryland	Hydrated Lime	Woodsboro	**60.48**	67.00	**2.39**	3.00	**6.50**	**62.87**
1582	Merion Lime and Stone Co., Norristown, Pennsylvania	Hydrated Lime	Centreville	**45.81**	44.00	**28.61**	30.00	**3.00**	**74.42**
1581	Merion Lime and Stone Co., Norristown, Pennsylvania	Hydrated Lime	Preston	**46.71**	44.00	**28.46**	30.00	**2.48**	**75.17**
1613	Palmer Lime and Cement Co., New York, N. Y.	Challenge Brand Hydrated Lime	York, Pennsylvania	**70.17**	65.00	**5.62**	5.00	**.50**	**75.79**
1584	Palmer Lime and Cement Co., New York, N. Y.	Challenge Brand Hydrated Lime	Colora	**69.68**	65.00	**5.57**	5.00	**.44**	**75.25**
1572	Security Cement and Lime Co., Hagerstown, Maryland	Berkeley Hydrated Lime	Baltimore	**70.56**	70.00	**1.52**	2.00	**.10**	**72.08**
1549	Security Cement and Lime Co., Hagerstown, Maryland	Berkeley Hydrated Lime	Laurel	**71.24**	70.00	**1.65**	2.00	**.35**	**72.89**
1615	Shank and Etzler, Frederick, Maryland	Hydrated Lime	Frederick	**42.17**	45.00	**25.70**	20.00	**7.22**	**67.87**
*1542	Shank and Etzler, Frederick, Maryland	Hydrated Lime	Waldorf	**38.92**	45.00	**25.07**	20.00	**10.95**	**63.99**
1567	Steacy and Wilton Company, Wrightsville, Pennsylvania	Sterling Brand Hydrated Lime	Hampstead	**68.94**	68.00	**4.98**	4.00	**1.52**	**73.92**

*Indicates product deficient in total Oxides.

ANALYSES OF AGRICULTURAL HYDRATED LIME.

No.	Name of Manufacturer or Agent	Name of Lime	Place of Sampling	Calcium Oxide CaO		Magnesium Oxide MgO		Sand & Insol. (no Val.)	Total Oxides Equivalent CaO+MgO
				Found	Guaranteed	Found	Guaranteed	Found	
1616	Steacy and Wilton Company, Wrightsville, Pennsylvania	Sterling Brand Hydrated Lime	Bittinger, Pa.	67.14	68.00	6.38	4.00	1.96	73.52
*1637	Superior Lime Company, York, Pennsylvania	Superior Brand Lime	Baltimore	64.96	70.00	4.07	3.00	1.72	69.03
1550	Tidewater Portland Cement Co., Baltimore, Maryland	Hydrated Lime	Laurel	71.01	71.00	.87	.50	1.60	71.88
1588	Charles Warner Company, Devault, Pennsylvania	Limoid (Hydrated Lime)	Chestertown	59.03	45.00	25.58	30.00	1.28	84.61
1639	Charles Warner Company, Devault, Pennsylvania	Limoid (Hydrated Lime)	Elkton	52.75	45.00	32.33	30.00	1.28	85.08
1573	Washington Building Lime Co., Baltimore, Maryland	Standard Hydrated Lime	Baltimore	73.02	70.00	1.32	2.00	1.76	74.34

ANALYSES OF AGRICULTURAL LIMESTONE, MARL AND OYSTER SHELLS.

1604	J. E. Baker Company, York, Pennsylvania	†Victor Ground Limestone	Billmyer, Pa.	30.91	26.00	18.80	18.00	5.10	49.71
1577	J. E. Baker Company, York, Pennsylvania	†Victor Ground Limestone	Greensboro	44.92	26.00	7.79	18.00	3.54	52.71
*1559	Baugh and Sons Company, Baltimore, Maryland	†Ground Oyster Shell Lime	Baltimore	45.08	47.00	.46	.50	12.76	45.54
1618	Beaver Dam Marble Company, Cockeysville, Maryland	†Dolomitic Limestone	Cockeysville	33.47	30.00	17.13	21.00	6.92	50.60
1579	Dorchester Fertilizer and Lime Co., Cambridge, Maryland	†Roasted Pulverized Oyster Shell Lime	Cambridge	40.32	40.00	.49	-----	25.56	40.81

1575	M. J. Grove Lime Company, Lime Kiln, Maryland	†Pulverized Limestone	Beltsville	53.03	50.00	.47	-----	2.48	53.50
*1609	Hagerstown Lime and Chemical Co., Hagerstown, Md.	†Lime Marl	Hagerstown	45.05	50.00	.29	-----	5.78	45.34
*1610	LeGore Lime Company, LeGore, Maryland	†Pulverized Limestone	LeGore	40.84	50.00	3.83	2.00	26.60	44.67
1583	Natural Lime-Marl Co., Roanoke, Virginia	†Lime Marl	Colora	51.86	50.00	.44	.50	4.32	52.30
1614	Palmer Lime and Cement Co., New York, N. Y.	†Challenge Brand Pul-Limestone Flour.	York, Pennsylvania	49.73	48.00	4.56	5.00	1.76	54.29
1585	Palmer Lime and Cement Co., New York, N. Y.	†Challenge Brand Pul. Limestone Flour.	Colora	49.00	48.00	5.50	5.00	2.18	54.50
1570	Potomac Poultry Food Co., Inc., Baltimore, Maryland	†Ground Oyster Shell Lime	Baltimore	46.51	46.00	.62	.50	10.84	47.13
*1544	Potomac Poultry Food Co., Inc., Baltimore, Maryland	†Ground Oyster Shell Lime	Baltimore	43.00	46.00	.48	.50	16.81	43.48
*1540	Potomac Poultry Food Co., Inc., Baltimore, Maryland	†Ground Oyster Shell Lime	Baltimore	44.19	46.00	.27	.50	13.60	44.46
*1645	Potomac Poultry Food Co., Inc., Baltimore, Maryland	†Ground Oyster Shell Lime	Gaithersburg	44.91	46.00	.54	.50	12.52	45.45
1566	Standard Lime and Stone Co., Baltimore, Maryland	†Pulverized Limestone	Thurmont	54.32	50.43	.54	.50	1.68	54.86
1587	W. H. Valliant and Brother, Bellevue, Maryland	Baked and Gr. Oyster Shell Lime	Bellevue	45.00	45.00	.58	-----	3.28	45.58
1649	Alba Marl Lime Co., Charles Town, W. Va.	†Lime Marl	Charles Town, W. Va.	53.42	50.00	.36	.50	2.20	53.78

* Indicates product deficient in total Oxides.

† Ground Shells or Stone, Mechanical Analysis on Page 17.

ANALYSES OF GYPSUM OR LAND PLASTER

No.	Name of Manufacturer or Agent	Name of Lime	Place of Sampling	Calcium Sulphate		Sand & Insol. (No. Val.)			
				Found	Guaranteed	Found			
1574	American Agricultural Chemical Co., New York, N. Y.	Ground Land Plaster	Jessups	85.68	74.00	3.30	-----	-----	-----
*1539	American Agricultural Chemical Co., New York, N. Y.	Ground Land Plaster	Baltimore	67.71	74.00	2.64	-----	-----	-----
1562	Hubbard Fertilizer Company, Baltimore, Maryland	Land Plaster	Baltimore	85.65	85.00	2.55	-----	-----	-----

ANALYSES OF MISCELLANEOUS PRODUCTS.

No.	Name of Manufacturer or Agent	Name of Lime	Place of Sampling	Calcium Oxide CaO		Magnesium Oxide MgO		Sand & Insol. (no Val.)	Total Oxides Equivalent CaO+MgO
				Found	Guaranteed	Found	Guaranteed	Found	
1586	Security Cement and Lime Co., Hagerstown, Maryland	Berkeley Hydra-Calcite Lime	Rising Sun	66.86	65.00	2.34	2.00	.80	69.20
1619	Security Cement and Lime Co., Hagerstown, Maryland	Berkeley Hydra-Calcite Lime	Sparks	65.31	65.00	2.51	2.00	1.20	67.82

TABLE II—SHOWING MECHANICAL ANALYSES OF GROUND LIMESTONE AND GROUND OYSTER SHELLS.

For the Chemical Analyses of these samples, see preceding table. Figures are percentages or pounds per hundred.

TABLE II—SHOWING MECHANICAL ANALYSES OF GROUND LIMESTONE AND GROUND OYSTER SHELLS.

For the Chemical Analyses of these samples, see preceding table. Figures are percentages or pounds per hundred. "Mesh" indicates the sieve used; "20 Mesh" has 20 wires to the inch.

No.	Name of Manufacturer or Agent	Name of Lime or Kind	Finer than 100 Mesh	Bet. 80 and 100 Mesh	Bet. 60 and 80 Mesh	Bet. 40 and 60 Mesh	Bet. 20 and 40 Mesh	Coarser than 20 Mesh
1604	J. E. Baker Company, York, Pennsylvania	Victor Ground Limestone	95	2	1	2	0	0
1577	J. E. Baker Company, York, Pennsylvania	Victor Ground Limestone	76	4	1	6	10	3
1559	Baugh and Sons Company, Baltimore, Maryland	Ground Oyster Shell Lime	37	12	4	14	32	1
1618	Beaver Dam Marble Company, Cockeysville, Maryland	Dolomitic Limestone.	73	4	1	2	4	16
1579	Dorchester Fertilizer and Lime Co., Cambridge, Md.	Roasted Pulverized Oyster Shell Lime	34	12	4	14	31	5
1575	M. J. Grove Lime Company Lime Kiln, Maryland	Pulverized Limestone	36	10	4	16	32	2
1609	Hagerstown Lime and Chemical Co., Hagerstown, Maryland	Lime-Marl	73	1	0	2	14	10
1610	LeGore Lime Company LeGore, Md.	Pulverized Limestone	91	7	1	1	0	0
1583	Natural Lime-Marl Company, Roanoke, Virginia	Lime-Marl	69	2	1	3	12	13
1614	Palmer Lime and Cement Co., New York, N. Y.	Challenge Brand Pul. Limestone Flour	100	0	0	0	0	0
1585	Palmer Lime and Cement Co., New York, N. Y.	Challenge Brand Pul. Limestone Flour	100	0	0	0	0	0
1570	Potomac Poultry Food Co., Inc., Baltimore, Maryland	Ground Oyster Shell Lime	43	10	4	14	28	1
1544	Potomac Poultry Food Co., Inc., Baltimore, Maryland	Ground Oyster Shell Lime	38	12	6	15	27	2
1540	Potomac Poultry Food Co., Inc., Baltimore, Maryland	Ground Oyster Shell Lime	51	10	3	11	24	1
1645	Potomac Poultry Food Co., Inc., Baltimore, Maryland	Ground Oyster Shell Lime	39	10	4	15	31	1
1566	Standard Lime and Stone Co., Baltimore, Maryland	Pulverized Limestone	58	13	4	15	10	0
1649	Alba Marl Lime Co., Charles Town, W. Va.	Lime Marl	58	1	0	3	18	20

The following firms had products registered as outlined, samples of which were not secured by our inspectors in the regular discharge of their duties:

Blair Limestone Co., Pittsburgh, Pa.		
Shenandoah Ground Lime	CaO 48%	MgO 48%
Herbert Bryant's Son, Alexandria, Va.		
Pulverized Oyster Shell Lime	CaO 45%	
Central Chemical Co., Hagerstown, Md.		
Gro-All Hydrated Lime	CaO 70%	MgO 2%
Knickerbocker Lime Co., Philadelphia, Pa.		
Hydrated Lime	CaO 45%	MgO 30%
Ground Limestone	CaO 26%	MgO 18%
Legore Lime Co., Legore Md.		
Ground Burnt Lime	CaO 80%	MgO 3%
Merion Lime & Stone Co., Norristown, Pa.		
Run of Kiln Lime	CaO 50%	MgO 30%
Security Cement & Lime Co., Hagerstown, Md.		
Berkeley Pulverized Limestone	CaO 44%	
Tidewater Portland Cement Co., Baltimore, Md.		
Tidewater Lump Lime	CaO 91%	MgO 1%
United States Gypsum Co., Chicago, Ill.		
Ben. Franklin Agr'l Gypsum	$CaSO_4 2H_2O$ 82%	
Charles Warner Co., Devault, Pa.		
Pulverized Limestone	CaO 29%	MgO 19%
Warner's "Limoid" Inoculated	CaO 45%	MgO 30%
Run-of-Kiln Lime	CaO 56%	MgO 37%
Pulverized Burned Lime	CaO 54%	MgO 36%
Washington Building Lime Co., Baltimore, Md.		
Standard Lime in Bulk	CaO 90%	MgO 2%
Standard (two-in-one Lime)	CaO 35%	MgO 1%
Ground Lime	CaO 90%	MgO 2%